Linda

IDD 9518
FF 17a
12/18/02

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December 18, 2002

Mr. Richard A. Albright, Director
Office of Waste and Chemical Management
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue
Seattle, WA 98101

Subject: Response to Notice of Deficiency dated November 25, 2002 – Pond 8E, Pond 15S, and Phase IV Closure and Post-Closure Plans,
FMC Idaho LLC.
EPA ID No. IDD 07092 9518

Dear Mr. Albright:

This letter and attachment provide FMC's response to the Notice of Deficiency (NOD) – Pond 8E, Pond 15S, and Phase IV Closure and Post-Closure Plans, FMC Idaho LLC, EPA ID No. IDD 07092 9518 received on November 29, 2002. The attachment provides responses and modifications to the Pond 8E, Pond 15S, and Phase IV closure and post-closure plans in the same order as the general and specific comments contained in the NOD dated November 25, 2002.

FMC remains committed to performing these closures during the 2003 construction season and requests EPA approval of these closure plans by January 10, 2003 in order to complete the procurement packages and proceed with these closures consistent with the closure plan schedules.

Please feel free to contact me at (208) 236-8216 should you have questions regarding this response.

Very truly yours,

Rob J Hartman

Rob J. Hartman
FMC Corporation

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Attachments

cc: Andrew Boyd, EPA w/o attachment
Linda Meyer, EPA w/ attachment (2 copies)
RCRA/CERCLA Manager, Shoshone-Bannock Tribes w/ attachment
Jeanette Wolfley, Shoshone-Bannock Tribes w/ attachment

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FMC Responses to EPA Comments on the
Pond 8E, Phase IV Ponds and Pond 15S Closure Plans

GENERAL COMMENTS

1. The Closure Plans do not comply with leak detection sump monitoring, liquid removal, and record-keeping requirements. 40 C.F.R. § 265.228 (b)(2) requires the owner/operator of a surface impoundment, which is to be closed as a landfill to maintain and monitor the leak detection system in accordance with 40 C.F.R. § 265. 226 (b). 40 C.F.R. § 265.226 (b)(2) requires the company to record the amount of liquids from the leak detection sump. The Closure and Post-closure Plans must be revised to include: 1) piping and system modifications for continued operation of the leak collection, detection, and removal system (LCDRS); 2) operating plans to monitor and remove liquids from the sumps and; 3) record keeping for the amount of liquid collected in the sumps.

   Response: Pond 8E, the Phase IV Ponds, and Pond 15S were all constructed prior to January 29, 1992, and as per 40 CFR § 265.221(a), they are not required to have a LCDRS. The Phase IV Ponds are single lined, and do not have LCDRSs, therefore no revisions to the Phase IV Ponds Closure Plan are needed. Ponds 8E and 15S each have a LCDRS, each of which has not been modified since the original construction of the ponds. There are no pumps or alarms in the leachate collection sumps and no above-ground piping associated with these LCDRSs.

   1) Piping modifications were not addressed in the Pond 8E and 15S closure plans because there is no above-ground piping associated with the LCDRSs with which closure activities could interfere.

   Section 7.2.1, the LCDRS paragraph for Ponds 8E and 15S, will be revised as follows: "The existing leak detection system will continue operating during closure and post-closure. The system will be maintained, inspected, and monitored consistent with 40 CFR § 265.226(a) and § 265.226(b) and the post-closure care plan in Section 10. Any liquid removed from the LCDRS sump(s) will be transported/conveyed and discharged to a new on-site water treatment facility or otherwise managed in accordance with RCRA requirements."

   Section 8.9 in the closure plans for Ponds 8E and 15S will be revised as follows: "The existing leak detection system will continue operating during closure and post-closure. The system will be maintained, inspected, and monitored weekly during the closure

period and quarterly during the first five years of the post-closure period and semiannually thereafter, as discussed in Section 10. If the liquid level reaches the inlet pipe of the LCDRS sump(s), the liquid will be removed via a portable pump and discharged into appropriate containers (e.g., 55-gallon drums). The liquid removed from the sump(s) will be transported/conveyed and discharged to a new on-site water treatment facility or otherwise managed in accordance with RCRA requirements."

2) For operating plans during closure, see the response to 1) above. During post-closure, water removed from the sump is addressed in Section 10.3, which states that water removed from the leachate collection sump(s) will be disposed of as described in Section 8.10.2 for Pond 15S (Section 8.11.2 for Pond 8E). The following will be added to Section 10.3 of Ponds 15S and 8E closure plans: "The LCDRS will be maintained and monitored consistent with 40 CFR § 265.226(b)."

3) Section 10.3 in the closure plans for Ponds 8E and 15S will be revised to further clarify record keeping as follows: "The level of any water collected in the LCDRS sump(s) will be noted on the inspection forms. If the water level in the sump reaches the invert of the inlet pipe into the sump, the water in the sump will be removed from the sump. The volume of water removed will be recorded on the inspection form." Record keeping is also addressed in Section 10.9 of the Pond 8E Closure Plan, in Section 10.11 in the 15S Closure Plan, and in Section D.8.2 of the RCRA Part B Permit Application.

2. The Closure Plans provide no analyses of the wastes remaining in the ponds. Although statements regarding relatively low elemental phosphorous concentrations in the non-hazardous slurry assurance project (NOSAP) slurry influent waste stream are included in Section 2.3.1 of the Pond 8E Closure Plan, supporting data are not included. The phosphorus concentrations in wastes placed in the pond before January 22, 1994, which were partially removed before NOSAP slurry was introduced into the impoundment, are not addressed. The phosphorous concentration in the settled solids is not estimated or addressed. While the assertions regarding the sediments being non-reactive and non-ignitable may be correct, absence of characterization data raises concern that these wastes may be similar to those in Pond 16S where gas emissions are occurring. The Closure Plans must be revised to include:

a) Results of analyses that have been conducted on the wastes in each pond, and a list of all hazardous constituents likely to be found.

Response for Pond 8E: As described in Section 2.3 of the Pond 8E Closure Plan, Pond 8E contained mostly NOSAP slurry at the time of closure. The NOSAP treated precipitator slurry discharged to Pond 8E was not subject to the Pond Management

Plan (PMP) requirements with respect to on-specification NOSAP treatment of precipitator slurry; however, FMC had established NOSAP specifications during operation of Pond 8E and only on-specification NOSAP slurry was routed to Pond 8E. The "pre-PMP" NOSAP specification was based on the same NOSAP pilot data that was the basis for the PMP NOSAP specification. Therefore, the data collected pursuant to the Pond Management Plan and the results of Tank V-3700 sampling conducted pursuant to the facility's waste analysis plan (WAP) are expected to be reasonably representative of the majority of material in Pond 8E. The results of NOSAP slurry sampling and analysis for elemental phosphorus conducted pursuant to the Pond Management Plan and the results of Tank V-3700 sampling conducted pursuant to the facility's waste analysis plan (WAP) were provided as Attachments 1 and 2 to the Pond 17, Response to EPA Notice of Deficiency submitted December 13, 2001, and are provided in Attachment A to this response.

Response for Phase IV Ponds: As described in Section 2.3 of the Phase IV Ponds Closure Plan, the Phase IV Ponds received phossy water from the Phos Dock and Furnace Building. The EMF Remedial Investigation, Table 4.2.3-1 lists results for analyses conducted on sediments from the Phase IV ponds 11S and 12S. A copy of Table 4.2.3-1 is provided in Attachment B. After the Phase IV Ponds were taken out of service, phossy water from V-3600 (Furnace Building) and V-3800 (Phos Dock) were routed to Pond 18. Results of Tank V-3600 and Tank V3800 sampling conducted pursuant to the waste analysis plan (WAP) were included as Attachments 1 and 2 to the Pond 18 Closure Plan, Response to EPA Notice of Deficiency submitted December 13, 2001, and are provided in Attachment B to this response. Attachment B also includes the results of organic analyses performed on a sample collected from V-3600 on January 30, 1998. These results and previous waste characterizations are representative of the waste composition of the material in the Phase IV Ponds.

Response for Pond 15S: As described in Section 2.3 of the Pond 15S Closure Plan, Pond 15S received phossy water from the Phos Dock and Furnace Building. The results referenced for the Phase IV Ponds are comparable to the Pond 15S wastes (see Attachment B). In addition, the EMF Remedial Investigation, Table 4.2.3-1 lists results for analyses of sediment from Pond 15S (see Attachment B). These results and previous waste characterizations are representative of the waste composition of the material in Pond 15S.

b) An assessment of the representativeness of the above data.

Response: The sampling and analytical methods were established to provide representative samples and comparable results using EPA established analytical methods to the extent practicable. The samples, collected and analyzed pursuant to the WAP, were compared to the waste characterization for the wastes placed in the Ponds. The results of WAP samples are consistent with the waste characterization.

c) An evaluation of the waste chemistry and a quantative assessment of the potential for closure of ponds to result in generation, accumulation and ignition of phosphine gas.

Response: This issue is addressed in Section 7.1.4. in each of the closure plans.

d) An assessment of the presence and the potential for future generation of hydrogen cyanide gas and other toxic releases from the ponds.

Response: Future gas generation in general is discussed in Section 7.1.4. The potential source of hydrogen cyanide gas is from cyanide in the wastes within the Ponds only to the extent that it has not yet escaped or reacted with the other constituents of the waste. Future generation of hydrogen cyanide from the capped wastes is unlikely as the capped unit will essentially be a closed system, hence changes in the chemistry of the waste are not anticipated.

Section 7.1.4 describes the limited potential for gas generation based on the characteristics of the waste material. In addition, to alleviate previous EPA concerns of potential gas generation from the wastes, a pressure monitoring/gas collection system was included in the final cap design as described in Section 7.1.4.1, Pressure Monitoring (Gas Collection) System. The collection piping system was designed based on the upper bound of gas generating potential using operating data from Pond 16S. This estimate did not take into consideration the limited oxygen environment or the saturated state of the wastes, both of which would reduce the gas generation rate. Therefore, it is viewed as the upper bound of gas generating potential of the waste material in the pond and the collection system was designed to this capacity.

As stated in Section 2.3.3 and described in Section 7.2.1, Ponds 8E, 15S, and the Phase IV Ponds were covered with initial fills and temporary covers in 1999. After initial fill placement and temporary cap installation, no gas build up underneath the temporary covers or measurable amount of gases have been detected. The pond solids have been compacted by the weight of the initial fills.

The observed conditions at the ponds after initial filling and temporary capping of the pond solids were similar to those observed at Pond 8S, indicating that the ignitability and reactivity of the waste material is minimal if not non-existent. Pond 8S was an unlined pond with untreated elemental phosphorus contained in the wastes. This pond was dewatered, backfilled and temporarily covered (similar to Ponds 8E, 15S and the Phase IV Ponds) in 1994, and the final cap was installed in 1999. Included in the final cap installation, per the EPA approved plan, a perimeter soil gas monitoring system, a temperature monitoring system, and a pressure monitoring/gas collection system were also installed. Throughout the consolidation period prior to the final cap construction and during the operating history of the monitoring systems after final cap construction, no evidence of reactions has been observed by inspection or maintenance personnel or recorded by the installed monitoring systems (Pond 8S post-closure monitoring data from 4Q1999 through 4Q2002). In addition, there has been no evidence of reactions at Pond 9E after final cap construction (Pond 9E post-closure monitoring data 4Q2000 through 4Q2002). This provides further evidence that no observable reactions have or are occurring within wastes contained in unlined and lined ponds after placement of the final cap. The above considerations and observations support the gas collection system design described in the closure plans. No revisions to the closure plans are necessary.

3. Prevention of future production of phosphorus pentoxide and phosphine, according to the Plans, depends on maintaining saturation of the wastes. The Plans assume that all wastes in the pond will remain saturated with water, ignoring probable desaturation resulting from three different circumstances:

   - Differential settlement of wastes during dewatering of the pond could desaturate the upper portion of the wastes around the edge of the pond.
   - Operation of the LCDRS should be expected to desaturate the entire pond, if the primary liner leaks, and
   - Decomposition of the PVC liners beneath the wastes

   The Closure and Post-Closure Plans must be revised to address future oxidation of the wastes with higher phosphorus concentrations due to desaturation at the pond edge(s), possible desaturation of a reasonable maximum amount of waste and the resulting gas generation, and the adequacy of proposed gas collection and treatment equipment to accommodate these conditions.

   Response: See response to General Comment # 2. No revision to the closure plans is necessary.

SPECIFIC COMMENTS

Section 2.3.3, Current Status

4. The "current status" description does not provide any information on the status of the liner systems or the settlement process, which had been underway for at least 30 months (since completion of the temporary caps on October 5, 1999) when the Closure Plans was submitted (May 2002). Revise the Closure Plans to provide the date(s) leakage was detected in the LCDRS, volume of liquids removed to date, if any, and a summary of cover settlement monitoring data.

Response: Quarterly settlement reports are submitted to EPA that include the requested settlement monitoring data.

The following sentence will be added to Section 2.3.3 in the Pond 8E Closure Plan. "No liquids have been observed in or removed from the LCDRS sump."

Section 2.3.3 of the Pond 15S Closure Plan will be revised as follows: "Small volumes of water have been observed and periodically removed from two of the four leachate collection sumps following installation of the initial fill and temporary cover in 1999. Table 2-1 provides a summary of the water removal from the Pond 15S LCDRS sumps during the closure period. FMC testing determined that the water was non-hazardous." Table 2-1 is provided as Attachment C.

Section 7.1.4, Gas Generation

5. The Closure Plans provide no information on the current status of the primary liner, but the design discussion assumes that the cap and bottom liner system will remain fully intact for the long term. Even if the primary liner is not currently leaking, it is reasonable to expect that minor breaks in the liner already exist or will develop during the post-closure period. If gases are generated within the wastes, they may migrate into the leak detection system (between the primary and secondary liners) and into the leak detection sump. This possible gas migration pathway is not addressed in the design basis discussion of gas generation or elsewhere in the plans. The Post-Closure Plans should be revised to include gas monitoring in the LCDRS sump during each inspection.

Response: At this time, the LCDRS monitoring does not indicate that there are any significant leaks in the primary pond liners. There is no indication that the initial fill has damaged the liner. Hence, the likelihood for the development of breaks in the liner

is very low. Gases would be most likely to enter the LCDRS system in a dissolved state within any small amount of pond water that may enter the system from the pond. Additional gas could be generated by oxidation of any constituents within the water when the water is exposed to air within the LCDRS. In either case, the quantities involved are predicted to be very low based on experience to date. The personal gas detection meters used by the personnel that perform the LCDRS sump monitoring have not detected any measurable quantities of gas. Migration of gas through the secondary liner would, for the same reasons discussed above for the primary liner, be at a very low rate. No revisions to the Closure Plans are necessary.

Section 8.9, Leak Detection System Operation

6. The Closure Plans do not describe the pumps, controls and piping or other arrangements whereby liquids removed from the sump can be transferred to another treatment, storage or disposal unit. The Closure Plans do not mention inspection frequency, removal of liquids from the leak detection sump, or recording of the amounts removed, although the LCDRS "will be operated." The Closure Plans must be revised to include a description of the leak detection sump pump and transport system that are, and will be, used to remove and transport liquids from the sump.

Response: The LCDRS in Ponds 8E and 15S do not contain pumps, controls, or piping for the removal of liquids. A portable pump and appropriate containers (e.g., 55-gallon drums) will be used to remove liquids. The amounts of liquids removed will be recorded. See responses to General Comment # 1 and Specific Comment # 7.

Section 8.9, Leak Detection System Operation and Section 10, Post-Closure Plan,

7. The Closure and Post-Closure Plans do not provide the pump operating level in the leak detection (LCDRS) sump. This elevation or depth is the level at which the pump must be operated to prevent backup of liquids in the impoundment drainage layer and to minimize head in the sump. The pump operating level is the benchmark against which liquid levels must be measured to comply with 40 CFR §265.226(b)(2). The Closure and Post-Closure Plans must be revised to define the pump operating level in each leak detection sump, and provide for measuring of liquid in the leak detection sump in relation to the pump operating level during every inspection of the sump.

Response: See response to General Comment #1. The following clarification will be made to the beginning of the second paragraph in Section 10.3: "The LCDRS will be maintained and monitored consistent with 40 CFR § 265.226(b). The leak detection

observation well/sump will also be inspected quarterly during the first five years of the post-closure period and semiannually thereafter and within..."

Section 8.9, Leak Detection System Operation, and Section 10, Post-Closure Plan

8. The Closure and Post-Closure Plans do not include determination of the average daily flow rate into the leak detection sump, and comparison with the action leakage rate, as required by 40 CFR §265.222(c). The average daily flow rate must be calculated monthly during the post-closure period. The Closure Plans must be revised to provide for calculation of the average daily flow rate and comparison with the action leakage rate. The Post-Closure Plans must be revised to provide for monthly calculation of the average daily flow rate (in accordance with 40 CFR §265.226(b)). For those units which the action leakage rate has not been previously established, a rate must be proposed as required and defined in 40 CFR §265.222(b).

Response: The 40 CFR §265.222 and 223 requirements regarding ALRs and RAPs do not apply to Ponds 8E, 15S, or the Phase IV Ponds because they were all constructed prior to January 29, 1992 and hence, per 40 CFR §265.221(a), ALRs are not required. In addition, all three ponds are currently being closed, the pond water has been removed, the initial fills are completed and temporary covers are in place. No revisions to the closure plans are necessary.

Section 8.9, Leak Detection System Operation

9. The Closure Plans do not address compliance with 40 CFR §265.228(b)(2). This regulation requires maintenance and monitoring of the leak detection system, as well as compliance with 40 C.F.R. §265.226(b), which requires weekly recording of the amount of liquids removed from the leak detection sump during the active life and closure period, and monthly after the final cover is installed. The Closure Plans must be revised to comply with 40 C.F.R §265.226(b)(2).

Response: See responses to General Comment #1 and Specific Comments #7 and #8. As discussed in the response to Specific Comment #4, no liquids have been observed at the leak detection sump at Pond 8E. Liquids have been observed and periodically removed from two of the four leak detection sumps at Pond 15S since completion of the initial fill and temporary cover in 1999. Table 2-1 provides a summary of the water removal from the Pond 15S LCDRS sumps during the closure period. The historical record indicates that monthly monitoring after the final covers are installed is not warranted and that quarterly monitoring will be sufficient in compliance with 40 C.F.R §265.226(b)(2).

Section 10.3, Inspection

10. The Post-Closure Plans propose quarterly inspections of the leak detection system (and all other aspects of the closed impoundment) for five years, and semiannual inspections thereafter. The Plan does not provide for initial (after the final cover is installed) monthly inspections of the leak detection sump as required by 40 CFR §265.226(b). In addition, the leak detection system inspection description (page 10-5) does not include the requirement to remove pumpable liquids from the sump as required by 40 CFR §265.221(a), or recording the amounts of liquids removed as required by 40 CFR §265.226(b)(2). The Inspection Record Form does not include space for recording amounts of liquids removed. The Post-Closure Plans Inspection Record Form and Activity Checklists must be revised to provide for initial monthly inspections of the leak detection sump, with potential reduced frequencies as provided in 40 CFR §265.226(b)(2). A separate record form for leak detection system inspections is recommended, with spaces for recording the amounts removed. The leak detection inspection description must be revised to include removal of pumpable liquids and recording of the amounts of liquids removed from the sump.

Response: Figure 10-2 will be revised to include a row for recording the amount of liquids removed from the LCDRS sump(s). The rows related to LCDRS monitoring on Figure 10-2 will not be applicable to the Phase IV Ponds. See responses to General Comment #1 and Specific Comment #8.

Section 10.4

11. Provide the basis for proposing to conduct settlement monitoring only annually after the first year.

Response: Section 10.4 applies only to settlement monitoring during the post-closure care period. As discussed in Section 7.4.5 of the closure plans, estimated settlement during the first 5 years following completion of the final caps range from 5.5 to 7.5 inches, with most of the settlement anticipated to occur during the first year. Settlement of these small magnitudes will not have adverse impacts on the performance of the final caps, as discussed in Section 7.4.8 of the closure plans. Monthly monitoring during the first year is sufficient to confirm these settlement estimates. Because of the low magnitudes of the anticipated settlement, yearly monitoring after the first year is sufficient to determine the long-term settlement trends.

Section 11, Section 12

12. Financial assurance information does not need to be included in the Closure Plans and should be removed.

Response: The closure and post-closure cost estimates and the financial assurance documentation will be removed from the Closure Plans. Sections 11 and 12 will be removed from the Closure Plans and blank placeholders used to maintain the section numbering systems.

Attachments:

A. Waste analyses related to Pond 8E

1. **Analytical Results for NOSAP Samples Collected From October 15, 1998 to October 10, 2001**
2. **Summary of Tank V-3700 WAP Sampling Results**
3. **Summary of Pond 17 Decant WAP Sampling Results**
4. **Summary of Pond 17 Decant Non-WAP Sampling Results**

B. Waste analyses related to the Phase IV Ponds and Pond 15S

RI Table 4.2.3-1

1. **Summary of Tank V-3600 WAP Sampling Results**
2. **Summary of Tank V-3800 WAP Sampling Results**
3. **Summary of Tank V-3600 Organics Sampling Results**
4. **Summary of Pond 18 Decant WAP Sampling Results**
5. **Summary of Pond 18 Decant Non-WAP Sampling Results**

C. New Table 2-1 for the Pond 15S Closure Plan

Pond 15S LCDRS Water Removed During Closure Period 2000-2002

Attachment A

Attachment 1.
Analytical Results for NOSAP Samples
Collected From October 15, 1998 to October 10, 2001

Sample Date	P4 ppm
10/15/98 A	120
10/15/98 B	128
10/16/98 A	219
10/16/98 B	144
10/18/98 A	129
10/18/98 B	193
10/19/98 A	216
10/19/98 B	215
10/20/98 A	269
10/20/98 B	235
10/21/98 A	304
10/21/98 B	347
10/22/98 A	356
10/22/98 B	374
10/23/98 A	201
10/23/98 B	180
10/27/98 A	187
10/27/98 B	192
10/28/98 A	73
10/28/98 B	71
10/29/98 A	90
10/29/98 B	107
10/30/98 A	100
10/30/98 B	110
11/1/98 A	68
11/1/98 B	63
11/3/98 A	68
11/3/98 B	76
11/7/98 A	139
11/7/98 B	181
11/8/98 A	111
11/8/98 B	123
11/9/98 A	88
11/9/98 B	95
11/12/98 A	289
11/12/98 B	250
11/13/98 A	303
11/13/98 B	310
11/14/98 A	320
11/14/98 B	316
11/15/98 A	185
11/15/98 B	163

Sample Date	P4 ppm
11/16/98 A	254
11/16/98 B	240
11/17/98 A	220
11/17/98 B	221
11/18/98A	161
11/18/98B	178
11/19/98A	257
11/19/98B	262
11/20/98A	268
11/20/98B	267
11/25/98A	977
11/25/98B	931
11/26/98A	203
11/26/98B	193
11/27/98A	127
11/27/98B	129
1/1/99A	319
1/1/99B	315
1/4/99A	130
1/4/99B	127
01/29/99	93
01/31/99	41
02/03/99	41
02/04/99	114
02/05/99	70
02/06/99	96
02/07/99	122
02/08/99	95
02/09/99	80
02/10/99	59
02/11/99	384
02/12/99	550
02/14/99	231
02/17/99	171
02/18/98	39
02/19/99	175
02/20/99	107
02/21/99	186
02/22/99	289
02/23/99	85
02/23/99	63
02/24/99	234

Sample Date	P4 ppm
02/25/99	269
02/26/99	1107
02/27/99	149
02/28/99	126
3/2/99A	271
3/2/99B	272
3/3/99A	99
3/3/99B	79
3/5/99A	67
3/5/99B	76
3/6/99A	57
3/6/99B	55
3/7/99A	93
3/7/99B	88
3/8/99A	50
3/8/99B	50
03/09/99	245
03/10/99	171
3/15/99A	135
3/15/99B	113
3/16/99A	216
3/16/99B	217
3/17/99A	144
3/17/99B	150
3/18/99A	167
3/18/99B	139
3/20/99A	199
3/20/99B	245
3/21/99A	176
3/21/99B	126
3/23/99A	631
3/23/99B	668
3/25/99A	172
3/25/99B	173
3/31/99A	55
3/31/99B	84
4/1/99A	132
4/1/99B	119
4/2/99A	119
4/2/99B	93
4/3/99A	39
4/3/99B	36

Attachment 1.
Analytical Results for NOSAP Samples
Collected From October 15, 1998 to October 10, 2001

Sample Date	P4 ppm
4/4/99A	139
4/4/99B	141
4/5/99A	115
4/5/99B	90
4/6/99A	63
4/6/99B	55
4/7/99A	46
4/7/99B	48
4/21/99A	138
4/21/99B	174
4/28/99A	301
4/28/99B	300
5/6/99A	283
5/6/99B	282
5/12/99A	249
5/12/99B	263
5/19/99A	319
5/19/99B	311
5/26/99A	96
5/26/99B	89
6/2/99A	141
6/2/99B	126
6/9/99A	148
6/9/99B	143
6/23/99A	101
6/23/99B	115
6/30/99A	256
6/30/99B	228
7/9/99A	206
7/9/99B	203
7/15/99A	42
7/15/99B	47
7/22/99A	34
7/22/99B	35
7/29/99A	94
7/29/99B	116
8/5/99A	38
8/5/99B	33
8/19/99A	59
8/19/99B	61
8/25/99A	14
8/25/99B	18

Sample Date	P4 ppm
9/1/99A	136
9/1/99B	118
09/04/99	83
09/05/99	66
09/06/99	46
09/07/99	35
09/08/99	30
09/09/99	27
09/10/99	44
09/11/99	89
09/12/99	49
09/13/99	39
09/14/99	66
09/15/99	38
09/16/99	77
09/17/99	65
9/4/99-9/9/99	54
9/10/99-9/15/99	51
9/16/99-9/21/99	121
9/22/99-9/25/99	75
9/28/99-10/3/99A	62
9/28/99-10/3/99B	49
10/4/99-10/9/99A	68
10/4/99-10/9/99B	64
10/10/99-10/15/99A	113
10/10/99-10/15/99B	94
10/16/99-10/21/99A	130
10/16/99-10/21/99B	120
10/22/99-10/27/99A	94
10/22/99-10/27/99B	89
10/28/99-11/2/99A	138
10/28/99-11/2/99B	125
11/3/99-11/8/99A	90
11/3/99-11/8/99B	109
11/9/99-11/14/99A	29
11/9/99-11/14/99B	30
11/15/99-11/20/99A	22
11/15/99-11/20/99B	18
11/21/99-11/26/99A	29
11/21/99-11/26/99B	19
11/27/99-12/2/99A	23
11/27/99-12/2/99B	24

Sample Date	P4 ppm
12/3/99-12/8/99A	37
12/3/99-12/8/99B	36
12/9/99-12/14/99	19
12/15/99-12/20/99A	37
12/15/99-12/20/99B	40
12/21/99-12/26/99A	41
12/21/99-12/26/99B	50
12/27/99-1/1/00A	52
12/27/99-1/1/00B	34
1/2/00-1/7/00A	29
1/2/00-1/7/00B	29
1/8/00-1/13/00A	70
1/8/00-1/13/00B	72
1/20/00-1/25/00A	105
1/20/00-1/25/00B	97
1/25/00-1/31/00A	62
1/25/00-1/31/00B	66
2/1/00-2/6/00A	114
2/1/00-2/6/00B	91
2/7/00-2/12/00A	98
2/7/00-2/12/00B	107
2/13/00-2/18/00A	66
2/13/00-2/18/00B	75
2/19/00-2/24/00A	181
2/19/00-2/24/00B	190
2/25/00-3/1/00A	137
2/25/00-3/1/00B	132
3/2/00-3/7/00A	105
3/2/00-3/7/00B	93
3/8/00-3/13/00A	144
3/8/00-3/13/00B	122
3/14/00-3/19/00A	113
3/14/00-3/19/00B	113
3/20/00-3/25/00A	132
3/20/00-3/25/00B	125
3/26/00-3/31/00A	149
3/26/00-3/31/00B	142
4/1/00-4/6/00A	166
4/1/00-4/6/00B	152
4/7/00-4/12/00A	135
4/7/00-4/12/00B	125
4/13/00-4/18/00A	78

Attachment 1.
Analytical Results for NOSAP Samples
Collected From October 15, 1998 to October 10, 2001

Sample Date	P4 ppm
4/13/00-4/18/00B	77
4/19/00-4/24/00A	180
4/19/00-4/24/00B	179
4/25/00-4/30/00A	76
4/25/00-4/30/00B	71
5/1/00-5/6/00A	101
5/1/00-5/6/00B	88
5/7/00-5/12/00A	174
5/7/00-5/12/00B	188
5/13/00-5/18/00A	126
5/13/00-5/18/00B	98
5/19/00-5/24/00A	87
5/19/00-5/24/00B	101
5/25/00-5/30/00A	69
5/25/00-5/30/00B	61
5/31/00-6/5/00A	86
5/31/00-6/5/00B	78
6/6/00-6/11/00A	73
6/6/00-6/11/00B	61
6/12/00-6/17/00A	77
6/12/00-6/17/00B	86
6/18/00-6/23/00A	67
6/18/00-6/23/00B	53
6/24/00-6/29/00A	116
6/24/00-6/29/00B	107
6/30/00-7/5/00A	105
6/30/00-7/5/00B	94
7/6/00-7/11/00A	86
7/6/00-7/11/00B	88
7/12/00-7/17/00A	31
7/12/00-7/17/00B	33
7/18/00-7/23/00A	87
7/18/00-7/23/00B	88
7/24/00-7/29/00A	75
7/24/00-7/29/00B	80
7/30/00-8/4/00A	100
7/30/00-8/4/00B	83
8/5/00-8/9/00A	161
8/5/00-8/9/00B	162
8/11/00-8/16/00A	95
8/11/00-8/16/00B	101
8/17/00-8/22/00A	81

Sample Date	P4 ppm
8/17/00-8/22/00B	85
8/28/00-9/2/00A	7
8/28/00-9/2/00B	7
9/3/00-9/8/00A	15
9/3/00-9/8/00B	13
9/9/00-9/14/00A	21
9/9/00-9/14/00B	17
9/15/00-9/20/00A	4
9/15/00-9/20/00B	4
9/21/00-9/26/00A	33
9/21/00-9/26/00B	31
9/27/00-10/2/00A	153
9/27/00-10/2/00B	168
10/3/00-10/8/00A	90
10/3/00-10/8/00B	100
10/9/00-10/14/00A	35
10/9/00-10/14/00B	36
10/15/00-10/20/00A	59
10/15/00-10/20/00B	67
10/21/00-10/26/00A	41
10/21/00-10/26/00B	47
10/27/00-11/1/00A	161
10/27/00-11/1/00B	168
11/2/00-11/7/00A	56
11/2/00-11/7/00B	61
11/8/00-11/13/00A	32
11/8/00-11/13/00B	37
11/14/00-11/19/00A	2017
11/14/00-11/19/00B	1949
11/20/00-11/25/00A	58
11/20/00-11/25/00B	62
11/26/00-12/1/00A	43
11/26/00-12/1/00B	43
12/2/00-12/7/00A	26
12/2/00-12/7/00B	30
12/8/00-12/13/00A	70
12/8/00-12/13/00B	76
12/14/00-12/19/00A	61
12/14/00-12/19/00B	65
12/20/00-12/25/00A	125
12/20/00-12/25/00B	126
12/26/00-12/31/00A	65

Sample Date	P4 ppm
12/26/00-12/31/00B	60
1/1/01-1/6/01A	62
1/1/01-1/6/01B	84
1/7/01-1/12/01A	204
1/7/01-1/12/01B	198
1/13/01-1/18/01A	100
1/13/01-1/18/01B	94
1/19/01-1/24/01A	210
1/19/01-1/24/01B	215
1/25/01-1/30/01A	183
1/25/01-1/30/01B	186
1/31/01-2/5/01A	170
1/31/01-2/5/01B	159
2/6/01-2/11/01A	104
2/6/01-2/11/01B	105
2/12/01-2/17/01A	95
2/12/01-2/17/01B	107
2/18/01-2/23/01A	103
2/18/01-2/23/01B	95
2/24/01-3/1/01A	104
2/24/01-3/1/01B	120
3/2/01-3/7/01A	108
3/2/01-3/7/01B	109
3/8/01-3/13/01A	40
3/8/01-3/13/01B	36
3/14/01-3/19/01A	71
3/14/01-3/19/01B	80
3/20/01-3/25/01A	32
3/20/01-3/25/01B	29
3/26/01-3/31/01A	20
3/26/01-3/31/01B	25
4/1/01-4/6/01A	380
4/1/01-4/6/01B	359
4/7/01-4/12/01A	125
4/7/01-4/12/01B	102
4/13/01-4/18/01A	188
4/13/01-4/18/01B	182
4/19/01-4/24/01A	83
4/19/01-4/24/01B	87
4/25/01-4/30/01A	63
4/25/01-4/30/01B	67
5/1/01-5/6/01A	157

Attachment 1.
Analytical Results for NOSAP Samples
Collected From October 15, 1998 to October 10, 2001

Sample Date	P4 ppm
5/1/01-5/6/01B	139
5/7/01-5/12/01A	201
5/7/01-5/12/01B	227
5/13/01-5/18/01A	121
5/13/01-5/18/01B	122
5/19/01-5/24/01A	116
5/19/01-5/24/01B	150
5/25/01-5/30/01A	131
5/25/01-5/30/01B	210
5/31/01-6/5/01A	176
5/31/01-6/5/01B	172
6/6/01-6/11/01A	202
6/6/01-6/11/01B	205
6/12/01-6/17/01A	300
6/12/01-6/17/01B	239
6/18/01-6/23/01A	47
6/18/01-6/23/01B	52
6/24/01-6/30/01A	33

Sample Date	P4 ppm
6/24/01-6/30/01B	37
7/1/01-7/6/01A	93
7/1/01-7/6/01B	118
7/7/01-7/12/01A	127
7/7/01-7/12/01B	122
7/14/01-7/17/01A	151
7/14/01-7/17/01B	139
7/19/01-7/24/01A	48
7/19/01-7/24/01B	52
7/25/01-7/30/01A	28
7/25/01-7/30/01B	29
7/31/01-8/5/01A	26
7/31/01-8/5/01B	29
8/6/01-8/11/01A	43
8/6/01-8/11/01B	41
8/12/01-8/17/01A	28
8/12/01-8/17/01B	30
8/18/01-8/23/01A	338

Sample Date	P4 ppm
8/18/01-8/23/01B	330
8/24/01-8/29/01A	148
8/24/01-8/29/01B	167
8/30/01-9/4/01A	108
8/30/01-9/4/01B	117
9/5/01-9/10/01A	26
9/5/01-9/10/01B	25
9/11/01-9/16/01A	196
9/11/01-9/16/01B	241
9/17/01-9/22/01A	206
9/17/01-9/22/01B	210
9/23/01-9/28/01A	132
9/23/01-9/28/01B	113
9/29/01-10/04/01A	10
9/29/01-10/04/01B	12
10/5/01-10/10/01A	44
10/5/01-10/10/01B	45

Average:	137
Standard Deviation:	171
Maximum:	2,017
Minimum:	4

Note: Analyses were performed on daily NOSAP samples from October 15, 1988 through September 17, 1999 and on 6-day composite samples from September 4, 1999 to present. All sample results were given equal weight in the above statistics.

Attachment 2
Summary of Tank V-3700 WAP Sampling Results

Analyte	Analytical Method	Sampling Date			
		09/22/98	07/08/99	07/11/00	06/14/01
Antimony	SW-846 6010B	1.78	1.87	7.21	U
Arsenic	SW-846 6010B	0.379	0.84	1.98	U
Barium	SW-846 6010B	0.020 J	0.082	0.00990J	U
Beryllium	SW-846 6010B	0.0042	0.0015	U	0.0041J
Cadmium	SW-846 6010B	0.587	0.068	0.0444	U
Chromium	SW-846 6010B	0.191	0.203	0.217	U
Lead	SW-846 6010B	0.067 J	0.03	0.0370J	U
Mercury	SW-846 7040A	U	U	U	U
Nickel	SW-846 6010B	U	U	0.0455	U
Selenium	SW-846 6010B	0.057 J	0.08	0.335	U
Silver	SW-846 6010B	0.006 J	U	0.0120J	U
Thallium	SW-846 6010B	U	U	0.0490J	U
Vanadium	SW-846 6010B	0.327	0.251	1.12	NA
Zinc	SW-846 6010B	34.3	88.4	158	NA
Cyanide	SW-846 9010B/90	NA	355	430	NA
Amenable cyanide	SW-846 9010B/90	NA	355	253	NA
Phosphorus - total	EPA 365.3	NA	NA	NA	1370
pH	SW-846 9040B	NA	11.7	12.61	11.09
Ignitability (degrees F)	SW-846 1010	>146	NA	NA	NA

Notes:

Units are mg/L unless noted otherwise
TCLP extraction for metals by SW-846 1311
U = Not detected
J = Estimated
NA = Not analyzed

Attachment 3
Summary of Pond 17 Decant WAP Sampling Results

Analytes	Analytical Method	Sample Date		
		07/07/99	07/12/00	06/15/01
Antimony	SW-846 6010B	1.48	7.67	1.99
Arsenic	SW-846 6010B	0.76	2.09	2.17
Barium	SW-846 6010B	0.054	0.0150J	0.062
Beryllium	SW-846 6010B	U	U	0.00072
Cadmium	SW-846 6010B	0.031	0.125	0.144
Chromium	SW-846 6010B	0.283	0.228	U
Lead	SW-846 6010B	0.03	0.0570J	U
Mercury	SW-846 7040A	U	U	U
Nickel	SW-846 6010B	U	0.0348	0.030J
Selenium	SW-846 6010B	0.14	0.315	U
Silver	SW-846 6010B	U	0.102	0.0753
Thallium	SW-846 6010B	U	0.0400J	U
Vanadium	SW-846 6010B	NA	1.12	NA
Zinc	SW-846 6010B	NA	170	NA
Cyanide	SW-846 9010B/9012A	316	465	26
Amenable cyanide	SW-846 9010B/9012A	306	459	20
Phosphorus - total	EPA 365.3	NA	NA	3,250
pH	SW-846 9040B	11.8	12.43	10.72

Notes:

Units are mg/L unless noted otherwise
TCLP extraction for metals by SW-846 1311
U = Not detected
J = Estimated
NA = Not analyzed

Attachment 4
Summary of Pond 17 Decant Non-WAP Sampling Results

Analytes	Analytical Method	Total	Dissolved
Aluminum	EPA 200.7	2.9	NA
Antimony	EPA 200.7	2.7	2.15
Arsenic	EPA 200.7	2.4	2.05
Barium	EPA 200.7	0.15	0.16
Beryllium	EPA 200.7	U	U
Cadmium	EPA 200.7	1	0.042
Calcium	EPA 200.7	284	NA
Chromium	EPA 200.7	0.44	0.35
Cobalt	EPA 200.7	U	U
Copper	EPA 200.7	0.69	0.66
Iron	EPA 200.7	61.5	NA
Lead	EPA 200.7	0.14	U
Magnesium	EPA 200.7	8.85	NA
Mercury	EPA 245.1	U	U
Nickel	EPA 200.7	U	U
Potassium	EPA 200.7	35,960	NA
Selenium	EPA 200.7	0.05	U
Silica	EPA 200.7	3.1	NA
Silver	EPA 200.7	0.07	0.08
Sodium	EPA 200.7	6,601	NA
Thallium	EPA 200.7	U	U
Vanadium	EPA 200.7	0.2	0.17
Zinc	EPA 200.7	330	114.6
Cyanide	SW-846 9010B/9012A*	460	NA
Phosphorus - total	EPA 365.3	4,113	NA
pH	EPA 150.1	11	NA
Alkalinity, Total	EPA 310.1	25,116	NA
Alkalinity, Bicarbonate	EPA 310.1	20,341	NA
Alkalinity, Carbonate	EPA 310.1	4,775	NA
Ammonia	EPA 350.1	3	NA
Chloride	EPA 300.0	3,125	NA
Fluoride	EPA 300.0	4,858	NA
Nitrate, N	EPA 300.0	6	NA
Sulfide: SO2	EPA 200.7	876	NA
Total Sulfur: SO4	EPA 200.7	3,041	NA
Ortho Phosphorus: P	EPA 365.2	1,988	NA
Conductivity us/cm	EPA 365.2	71,800	NA
Turbidity, NTU	EPA 180.1	68	NA
Total Disolved Solids	EPA 160.1	89,270	NA
Total Suspended Solids	EPA 160.2	932	NA

Notes:

Units are mg/L unless noted otherwise

The sample for the above results was collected on 09/29/01 and analyzed in Astaris's on-site laboratory.

* = Astaris proprietary method equivalent to SW-846 9010B/9012A was used.

U = Not detected

NA = Not analyzed

Attachment B

TABLE 4.2.3-1
CONCENTRATIONS OF PARAMETERS IN FMC FEEDSTOCK, BYPRODUCT, AND WASTE SAMPLES

TABLE 4.2.3-1

Parameter	Phosphate Ore FOSFPO01		Calciner Pond Sediment FSDCPW01		IWW Ditch Sediment FSDIWW01		FSDIWW02		FSDIWW03		FSDIWW04		FSDIWW05		IWW Ditch Basin Sediment FSDIWW06		Railroad Swale Sediment FSDRRS01		Coke-Settling Pond Waste Sediment FWSCSP01		Ferrophos Composite FWSFSA01		FWSFSA02	
Aluminum	12400		11400		12800		18200		13800		10700		12900		9320		21800		718		1650		1430	
Antimony	16.8	UJ	59.2	J	82.8	UJ	53.3	UJ	39.6	UJ	29.3	UJ	37.6	UJ	25.3	UJ	43.7	UJ	13.9	U	61.4	J	42.3	J
Arsenic	14.6	J	6.7	UJ	38	J	17.5	J	25	J	9.2	J	20.8	J	13.3	J	21.1	J	0.49	UJ	0.52	UJ	1.8	UJ
Barium	105		94.6		886		591		650		645		1530		467		333		25.5		23.6		14.5	
Beryllium	1.9		1.3		1.6	U	1.4	U	1.4	U	0.71	U	1.3	U	0.65		2.7		0.18	U	4.1		1.7	
Boron	74.3		2640		50.1		44.5		50		27.9		52.1		36.2		108		11.7	J	4.8		7.6	
Cadmium	77.8	J	426	J	267	J	139	J	245	J	112	J	569	J	234	J	318	J	2.6		0.98	UJ	0.99	UJ
Calcium	232000		284000		121000		161000		76900		72800		114000		107000		391000		3930		17000		16900	
Chromium	822		531		582		377		418		218		677		275		737		8.2		6320		2550	
Cobalt	0.87	U	1.7	U	57		34.6		52.6		34.3		62.2		56.9		4.6		0.9		29.1		14.7	
Copper	104		58.9		1920		890		1430		687		2440		1050		168		7.3	J	851		453	
Fluoride	13200		191000		7460		8560		6320		5880		11400		9140		29500		228		1790		1890	
Iron	8910	J	5440	J	19300	J	14600	J	14300	J	10300	J	18200	J	10100	J	11400	J	2570		84500	J	38500	J
Lead	12.1	UJ	30.9	UJ	96.3	UJ	46.9	UJ	82	UJ	38.9	UJ	137	J	50.8	UJ	26.7	UJ	5.7	J	6.1	U	6.1	U
Lithium	11.8	UJ	23.1	UJ	13.1	UJ	15.7	UJ	11.8	UJ	9.6	UJ	11.9	UJ	8.2	UJ	17.4	UJ	9.1	U	1.2	UJ	1.1	UJ
Magnesium	2000		4730		10500		10900		9030		7770		6780		6230		6470		371		474		262	
Manganese	122		91.8		1220		1190		1260		4400		3950		1500		253		49.6		307		264	
Mercury	0.36	UJ	0.31	UJ	4	J	4.5	J	6	J	1.2	J	2.8	J	2.1	J	0.96	UJ	0.24		0.11	UJ	0.08	UJ
Molybdenum	15	U	32.5	U	14	U	9	U	8.5	U	4.9	U	13.8	U	10.3	U	18.5	U	3.6	U	151		93.2	
Nickel	126		79		99.6		88.3		72.6		62		121		68.1		126		9.1	U	1150		727	
Orthophosphate	3460		13200		1490		1040		915		391		1560		289		1760		15.9		37.5		13.7	
Total Phosphorus	65900		91000		42600		38200		28100		22700		45300		40400		123000		306		1510		902	
Potassium	3540		79800		3180		4310		3340		2510		3340		2190		6700		192		549		410	
Selenium	6.1	J	3.8	UJ	28.4	J	14.7	J	11	J	7.1	UJ	17.6	J	12.7	J	13.8	J	1.4	U	2.6	UJ	0.24	UJ
Silver	5.1		25.1		58.1		14.7		37.4		12.6		72.8		22.8		9.4		0.72	U	47		27	
Sodium	3400		20300		3990		3200		2070		1570		2910		1840		7140		565	J	553		583	
Sulfate	NA		NA		NA		NA		NA		NA		NA		NA		NA		764		NA		NA	
Thallium	26.2	R	50.35	R	129.1	R	83	R	61.7	R	45.6	R	58.6	R	39.4	R	68	R	0.1	UJ	23.6	R	23.8	R
Vanadium	996		607		423		366		317		185		460		276		1000		7.1		6330		2610	
Zinc	991	J	6000	J	6780	J	2930	J	4380	J	1980	J	8230	J	2730	J	2770	J	67.4		97.3	J	70.3	J

Notes: Concentrations in mg/kg
NA - Not Analyzed
U - Not Detected
J - Estimated Value
R - Rejected Value

Attachment 1
Summary of Tank V-3600 WAP Sampling Results

Analyte	Analytical Method	Sampling Date				
		01/09/98	09/22/98	07/08/99	07/12/00	06/14/01
Antimony	SW-846 6010B	R	0.71	0.67	1.28	0.743
Arsenic	SW-846 6010B	R	0.167	0.20	0.227	0.25 J
Barium	SW-846 6010B	R	0.015 J	0.098	0.0120 J	0.027 J
Beryllium	SW-846 6010B	0.0250	0.0098	0.0066	0.0042	0.00510
Cadmium	SW-846 6010B	R	0.045	0.119	0.205	0.273
Chromium	SW-846 6010B	0.448	0.232	0.290	0.141	U
Lead	SW-846 6010B	R	0.032 J	0.04	U	U
Mercury	SW-846 7040A	ND	U	U	U	U
Nickel	SW-846 6010B	R	U	0.028	0.138	U
Selenium	SW-846 6010B	R	U	U	0.0360 J	U
Silver	SW-846 6010B	ND	0.003 J	U	0.00480 J	U
Thallium	SW-846 6010B	R	0.022 J	U	0.0290 J	U
Vanadium	SW-846 6010B	0.416	0.236	0.239	0.243	NA
Zinc	SW-846 6010B	65.4	56.7	49.2	22.4	NA
pH	SW-846 9040B	9.0	NA	6.65	5.89	6.220
Cyanide	SW-846 9010B/90	83.5	NA	10.1	11.6	NA
Amenable cyanide	SW-846 9010B/90	79.1	NA	8.13	9.13	NA
Phosphorus, total	EPA 365.3	NA	NA	NA	NA	5,770
Total Organic Carbon	EPA 415.1	U	NA	NA	NA	NA
Total Organic Halogen (ug/L)	SW-846 9020B	U	NA	NA	NA	NA

Notes:

Units are mg/L unless noted otherwise
TCLP extraction for metals by SW-846 1311
R = Rejected
U = Not detected
J = Estimated
R = Rejected

Attachment 2
Summary of Tank V-3800 WAP Sampling Results

Analyte	Analytical Method	Sampling Date				
		01/09/98*	09/22/98*	07/08/99*	07/11/00	6/16/2001
Antimony	SW-846 6010B	NA	NA	0.33	0.295	0.28 J
Arsenic	SW-846 6010B**	R	0.42	0.12	0.0760 J	0.175
Barium	SW-846 6010B**	R	0.117	0.035	0.0110 J	0.0388
Beryllium	SW-846 6010B**	0.0111	0.007 J	0.0027	0.00221	0.00225
Cadmium	SW-846 6010B**	R	0.0032	0.059	0.0150 J	0.0928
Chromium	SW-846 6010B**	0.614	0.162	0.149	0.106	0.145
Lead	SW-846 6010B**	R	0.177	0.02	U	U
Mercury	SW-846 7040A***	U	U	U	U	U
Nickel	SW-846 6010B**	R	U	0.035	0.0361	0.128
Selenium	SW-846 6010B**	U	0.277	U	0.0470 J	U
Silver	SW-846 6010B**	U	U	U	U	U
Thallium	SW-846 6010B**	U	U	U	U	U
Vanadium	SW-846 6010B**	0.255	0.011 J	0.077	0.0896	NA
Zinc	SW-846 6010B**	34.3	0.094	24.8	5.55	NA
pH	SW-846 6010B**	10	5.72	7.07	6.120	6.390
Cyanide	SW-846 9010B/90	NA	NA	23.1	28.3	12 J
Amenable cyanide	SW-846 9010B/90	NA	NA	21.9	27.3	11 J
Phosphorus, total	EPA 365.3	NA	NA	NA	NA	1,340

Notes:

Units are mg/L unless noted otherwise
TCLP extraction for metals by SW-846 1311
U = Not detected
J = Estimated
NA = Not analyzed
R = Rejected
* = Samples collected from the NE Phos Dock Tank, a precursor to V-3800
** = Method SW-846 6010A used for both 1998 samples
*** = Method SW-846 7470 used for both 1998 samples

Attachment 3
Summary of V-3600 Organics Sampling Results

Analyte	Analytical Method	Result	Detection Limit
pH	In-house	**9.0**	1.0
Acetone	SW-846 8260A	U	4.42
Acrolein	SW-846 8260A	U	17.97
Acrylonitrile	SW-846 8260A	U	2.22
Allyl Chloride	SW-846 8260A	U	1.58
Benzene	SW-846 8260A	U	0.43
Bromodichloromethane	SW-846 8260A	U	0.41
Bromoform	SW-846 8260A	U	0.54
Bromomethane	SW-846 8260A	U	1.15
2-Butanone (MEK)	SW-846 8260A	U	3.32
Carbon disulfide	SW-846 8260A	U	0.35
Carbon tetrachloride	SW-846 8260A	U	0.32
Chlorobenzene	SW-846 8260A	U	0.19
2-Chloro-1,3-butadiene (Chloroprene	SW-846 8260A	U	1.14
Chloroethane	SW-846 8260A	U	1.11
Chloroform	SW-846 8260A	U	0.23
Chloromethane	SW-846 8260A	U	0.82
Dibromochloromethane	SW-846 8260A	U	0.53
1,2-Dibromo-3-chloropropane (DBCP)	SW-846 8260A	U	2
1,2-Dibromoethane (EDB)	SW-846 8260A	U	0.65
Dibromomethane (methylene bromide)	SW-846 8260A	U	0.49
trans-1,4-Dichloro-2-butene	SW-846 8260A	U	1.7
Dichlorodifluoromethane	SW-846 8260A	U	0.74
1,1-Dichloroethane	SW-846 8260A	U	0.38
1,2-Dichloroethane	SW-846 8260A	U	0.38
1,1-Dichloroethene	SW-846 8260A	U	0.94
trans-1,2-Dichloroethene	SW-846 8260A	U	1.29
1,2-Dichloropropane	SW-846 8260A	U	0.57
cis-1,3-Dichloropropene	SW-846 8260A	U	0.6
Trans-1,3-Dichloropropene	SW-846 8260A	U	0.37
Ethylbenzene	SW-846 8260A	U	0.21
Ethyl methacrylate	SW-846 8260A	U	0.86
2-Hexanone	SW-846 8260A	U	1.59
Methyl Iodide	SW-846 8260A	U	1.7
Methacrylonitrile	SW-846 8260A	U	4.58
Methylene chloride (Dichloromethane)	SW-846 8260A	U	0.34
Methyl methacrylate	SW-846 8260A	U	0.85
4-Methyl-2-pentanone (MIBK)	SW-846 8260A	U	2.02
Pentachloroethane	SW-846 8260A	U	72
Propionitrile	SW-846 8260A	U	11.55
Styrene	SW-846 8260A	U	0.59
1,1,1,2-Tetrachloroethane	SW-846 8260A	U	0.25
1,1,2,2-Tetrachloroethane	SW-846 8260A	U	1.45
Tetrachloroethene	SW-846 8260A	U	0.58

Attachment 3 (continued)
Summary of V-3600 Organics Sampling Results

Analyte	Analytical Method	Result	Detection Limit
Toluene	SW-846 8260A	U	0.52
1,1,1-Trichloroethane	SW-846 8260A	U	0.4
1,1,2-Trichloroethane	SW-846 8260A	U	0.54
Trichloroethene	SW-846 8260A	U	0.61
Trichlorofluoromethane	SW-846 8260A	U	0.43
1,2,3-Trichloropropane	SW-846 8260A	U	1.33
Vinyl acetate	SW-846 8260A	U	0.94
Vinyl chloride	SW-846 8260A	U	0.87
m+p-Xylene	SW-846 8260A	U	0.9
o-Xylene	SW-846 8260A	U	0.64
Acenaphthene	SW-846 8270A	U	4.84
Acenaphthylene	SW-846 8270A	U	4.37
Acetophenone	SW-846 8270A	U	1.4
2-Acetylaminofluorene	SW-846 8270A	U	2.3
4-Aminobiphenyl	SW-846 8270A	U	7.7
Aniline	SW-846 8270A	U	0.73
Anthracene	SW-846 8270A	U	7.21
Aramite	SW-846 8270A	U	33
Benz(a)anthracene	SW-846 8270A	U	7.49
Benzo(b)fluoranthene	SW-846 8270A	U	6.36
Benzo(k)fluoranthene	SW-846 8270A	U	8.45
Benzo(ghi)perylene	SW-846 8270A	U	6.45
Benzo(a)pyrene	SW-846 8270A	U	10.18
Benzyl alcohol	SW-846 8270A	U	11.12
bis(2-Chloroethoxy)methane	SW-846 8270A	U	5.41
bis(2-Chloroethyl)ether	SW-846 8270A	U	5.45
bis(2-Chloroisopropyl)ether	SW-846 8270A	U	5.44
bis(2-Ethylhexyl)phthalate	SW-846 8270A	U	9.36
4-Bromophenyl-phenyl ether	SW-846 8270A	U	5.46
Butylbenzyl phthalate	SW-846 8270A	U	12.68
p-Chloroaniline	SW-846 8270A	U	4.33
Chlorobenzilate	SW-846 8270A	U	0.74
4-Chloro-3-methylphenol	SW-846 8270A	U	4.31
2-Chloronaphthalene	SW-846 8270A	U	5.15
2-Chlorophenol	SW-846 8270A	U	5.72
4-Chlorophenyl-phenyl ether	SW-846 8270A	U	5.2
Chrysene	SW-846 8270A	U	7.49
2-Methylphenol (o-Cresol)	SW-846 8270A	**7.40**	4.94
Diallate (cis)	SW-846 8270A	U	2.5
Diallate (trans)	SW-846 8270A	U	2.6
Dibenzofuran	SW-846 8270A	U	4.48
Di-N-butyl phthalate	SW-846 8270A	U	12.51
Dibenz(a,h)anthracene	SW-846 8270A	U	6.66
1,2-Dichlorobenzene	SW-846 8270A	U	4.61

Attachment 3 (continued)
Summary of V-3600 Organics Sampling Results

Analyte	Analytical Method	Result	Detection Limit
1,3-Dichlorobenzene	SW-846 8270A	U	4.6
1,4-Dichlorobenzene	SW-846 8270A	U	4.53
3,3'-Dichlorobenzidine	SW-846 8270A	U	6.69
2,4-Dichlorophenol	SW-846 8270A	U	5.43
2,6-Dichlorophenol	SW-846 8270A	U	6.7
Diethyl phthalate	SW-846 8270A	U	9.62
Thionazin	SW-846 8270A	U	1.8
Dimethoate	SW-846 8270A	U	5.8
p-(Dimethylamino)azobenzene	SW-846 8270A	U	2.8
7,12-Dimethylbenz(a)anthracene	SW-846 8270A	U	2.9
3,3'-Dimethylbenzidine	SW-846 8270A	U	4.5
a,a-Dimethylphenethylamine	SW-846 8270A	U	22
2,4-Dimethylphenol	SW-846 8270A	U	4.25
Dimethyl phthalate	SW-846 8270A	U	2.05
Diphenylamine	SW-846 8270A	U	5.5
1,3-Dinitrobenzene	SW-846 8270A	U	1.9
4,6-Dinitro-2-methylphenol	SW-846 8270A	U	6.73
2,4-Dinitrophenol	SW-846 8270A	U	3.23
2,4-Dinitrotoluene	SW-846 8270A	U	4.37
2,6-Dinitrotoluene	SW-846 8270A	U	4.15
Di-N-octyl phthalate	SW-846 8270A	U	8.35
Ethyl methanesulfonate	SW-846 8270A	U	0.99
Famphur	SW-846 8270A	U	7.28
Fluoranthene	SW-846 8270A	U	6.93
Fluorene	SW-846 8270A	U	4.79
Hexachlorobenzene	SW-846 8270A	U	7.14
Hexachlorobutadiene	SW-846 8270A	U	5.33
Hexachlorocyclopentadiene	SW-846 8270A	U	0.48
Hexachloroethane	SW-846 8270A	U	4.79
Hexachloropropene	SW-846 8270A	U	0.9
Hexachlorophene	SW-846 8270A	U	200
Indeno(1,2,3-cd)pyrene	SW-846 8270A	U	6.61
Isodrin	SW-846 8270A	U	2.5
Isophorone	SW-846 8270A	U	5.39
Isosafrole	SW-846 8270A	U	1.6
Kepone	SW-846 8270A	U	110
Methapyrilene	SW-846 8270A	U	13
3-Methylcholanthrene	SW-846 8270A	U	2.6
Methyl methanesulfonate	SW-846 8270A	U	0.77
2-Methylnaphthalene	SW-846 8270A	U	5.01
Naphthalene	SW-846 8270A	U	4.74
1,4-Naphthoquinone	SW-846 8270A	U	0.27
1-Naphthylamine	SW-846 8270A	U	4
2-Naphthylamine	SW-846 8270A	U	4

Attachment 3 (continued)
Summary of V-3600 Organics Sampling Results

Analyte	Analytical Method	Result	Detection Limit
2-Nitroaniline	SW-846 8270A	U	3.84
3-Nitroaniline	SW-846 8270A	U	4.47
4-Nitroaniline	SW-846 8270A	U	4.57
Nitrobenzene	SW-846 8270A	U	4.83
2-Nitrophenol	SW-846 8270A	U	5.32
4-Nitrophenol	SW-846 8270A	U	2.02
4-Nitroquinoline-1-oxide	SW-846 8270A	U	220
N-Nitrosodi-N-butylamine	SW-846 8270A	U	1.4
N-Nitrosodiethylamine	SW-846 8270A	U	4
N-Nitrosodimethylamine	SW-846 8270A	U	3.51
N-Nitrosodiphenylamine	SW-846 8270A	U	5.45
N-Nitrosodi-N-propylamine	SW-846 8270A	U	5.59
N-Nitrosomethylethylamine	SW-846 8270A	U	0.74
N-Nitrosomorpholine	SW-846 8270A	U	0.92
N-Nitrosopiperidine	SW-846 8270A	U	1.5
N-Nitrosopyrrolidine	SW-846 8270A	U	0.97
5-Nitro-o-toluidine	SW-846 8270A	U	1.8
Parathion, Ethyl	SW-846 8270A	U	15
Pentachlorobenzene	SW-846 8270A	U	1.4
Pentachloronitrobenzene	SW-846 8270A	U	2.3
Pentachlorophenol	SW-846 8270A	U	4.88
Phenacetin	SW-846 8270A	U	1.6
Phenanthrene	SW-846 8270A	U	6
Phenol	SW-846 8270A	**22.7**	2.83
1,4-Phenylenediamine	SW-846 8270A	U	20
2-Picoline	SW-846 8270A	U	1.3
Pronamide	SW-846 8270A	U	2.4
Pyrene	SW-846 8270A	U	7.43
Pyridine	SW-846 8270A	U	3.49
Safrole	SW-846 8270A	U	2
1,2,4,5-Tetrachlorobenzene	SW-846 8270A	U	1.6
2,3,4,5 or 2,3,4,6-Tetrachloropheno	SW-846 8270A	U	32
Tetraethyldithiopyrophosphate	SW-846 8270A	U	1.9
o-Toluidine	SW-846 8270A	U	1.1
1,2,4-Trichlorobenzene	SW-846 8270A	U	4.86
2,4,5-Trichlorophenol	SW-846 8270A	U	4.27
2,4,6-Trichlorophenol	SW-846 8270A	U	4.63
o,o,o-Triethylphosphorothioate	SW-846 8270A	U	1.7
1,3,5-Trinitrobenzene	SW-846 8270A	U	8.9
3 and 4- Methylphenol (m+p cresol)	SW-846 8270A	**11.6**	5.2

Notes:

Sample collected 01/30/98
Units are ug/L unless noted otherwise
Semivolitile extraction by SW-846 3510B
U = Not detected

Attachment 4
Summary of Pond 18 Decant WAP Sampling Results

Analyte	Analytical Method	Sample Date		
		07/07/99	07/12/00	06/15/01
Antimony	SW-846 6010B	0.50	0.331	0.32 J
Arsenic	SW-846 6010B	0.16	0.153	0.277
Barium	SW-846 6010B	0.025	0.0140 J	0.0590
Beryllium	SW-846 6010B	0.0082	0.00525	0.00382
Cadmium	SW-846 6010B	0.013	0.0516	0.0391
Chromium	SW-846 6010B	0.360	0.283	0.142
Lead	SW-846 6010B	0.04	0.0400 J	0.038 J
Mercury	SW-846 7040A	U	U	U
Nickel	SW-846 6010B	0.026	0.0589	0.050 J
Selenium	SW-846 6010B	0.03	0.0890 J	0.096 J
Silver	SW-846 6010B	U	0.00460 J	U
Thallium	SW-846 6010B	U	U	U
Vanadium	SW-846 6010B	NA	0.349	NA
Zinc	SW-846 6010B	NA	14.2	NA
Cyanide	SW-846 9010B/9012A	5.90	0.385	0.18 J
Cyanide, Amenable	SW-846 9010B/9012A	5.40	0.284	U
Phosphorus, total	EPA 365.3	NA	NA	0.510
pH	SW-846 9040B	6.92	6.69	6.510

Notes:

Units are mg/L unless noted otherwise
TCLP extraction for metals by SW-846 1311
U = Not detected
J = Estimated
NA = Not analyzed

Attachment 5
Summary of Pond 18 Decant Non-WAP Sampling Results

Analytes	Analytical Method	Total	Dissolved
Aluminum	EPA 200.7	0.9	NA
Antimony	EPA 200.7	0.29	0.27
Arsenic	EPA 200.7	0.21	0.2
Barium	EPA 200.7	U	U
Beryllium	EPA 200.7	0.003	0.003
Cadmium	EPA 200.7	0.063	0.047
Calcium	EPA 200.7	58.8	NA
Chromium	EPA 200.7	0.19	0.18
Cobalt	EPA 200.7	0.02	0.01
Copper	EPA 200.7	U	U
Iron	EPA 200.7	4.3	NA
Lead	EPA 200.7	U	U
Magnesium	EPA 200.7	14.94	NA
Mercury	EPA 245.1	U	U
Nickel	EPA 200.7	0.06	0.05
Potassium	EPA 200.7	3,550	NA
Selenium	EPA 200.7	0.08	U
Silica	EPA 200.7	0.1	NA
Silver	EPA 200.7	U	U
Sodium	EPA 200.7	1,087	NA
Thallium	EPA 200.7	U	U
Vanadium	EPA 200.7	0.13	0.12
Zinc	EPA 200.7	9.52	8.56
Cyanide	SW-846 9010B/9012A*	0.27	NA
Phosphorus - total	EPA 365.3	2,156	NA
pH	EPA 150.1	6	NA
Alkalinity, Total	EPA 310.1	987	NA
Alkalinity, Bicarbonate	EPA 310.1	987	NA
Alkalinity, Carbonate	EPA 310.1	U	NA
Ammonia	EPA 350.1	73	NA
Chloride	EPA 300.0	505	NA
Fluoride	EPA 300.0	472	NA
Nitrate, N	EPA 300.0	2	NA
Sulfide: SO2	EPA 200.7	138	NA
Total Sulfur: SO4	EPA 200.7	1,305	NA
Ortho Phosphorus: P	EPA 365.2	1,891	NA
Conductivity us/cm	EPA 365.2	13,150	NA
Turbidity, NTU	EPA 180.1	7	NA
Total Dissolved Solids	EPA 160.1	14,956	NA
Total Suspended Solids	EPA 160.2	95	NA

Notes:

Units are mg/L unless noted otherwise

The sample for the above results was collected on 09/29/01 and analyzed in Astaris's on-site laboratory.

* = Astaris proprietary method equivalent to SW-846 9010B/9012A was used.

U = Not detected

NA = Not analyzed

Attachment C

Table 2-1

Pond 15S LCDRS Water Removed During Closure Period 2000-2002

Date	Manhole Number			
	#1 (East)	#2	#3	#4 (West)
05/10/00				250
12/04/00				250
01/16/01				250
03/13/01				250
08/20/01				250
10/08/01				250
12/04/01				250
01/30/02				250
03/20/02				250
08/12/02				250
10/01/02	30			
11/23/02	90			250
Total (gallons):	**120**	**0**	**0**	**2,750**